Chapter 35

Nursing Care of Patients with Disorders of the Urinary Tract

Urinary Tract Infections (UTI)

- Invasion of the urinary tract by bacteria
- Incidence in women is greater than in men
  - Shorter urethra
  - Location of meatus
- Elderly men are susceptible because of enlarged prostate
  - Obstruction to flow of urine

UTI Predisposing Factors

- Stasis of urine
  - Obstruction
  - Not voiding often enough
  - Overdistention of bladder decreasing blood supply
  - Stagnant urine good medium for bacterial growth

UTI Predisposing Factors

- Contamination in perineal/urethral area
  - Fecal incontience
  - Improper wiping technique
  - Intercourse
  - Presence of infection (vaginitis, epididymitis, or prostatitis)

UTI Predisposing Factors

- Instrumentation
  - Catheter
  - Cystoscopy
- Reflux of urine
  - Congenital
  - Complication from previous infections

UTI Predisposing Factors

- Previous UTI's
  - More prone

UTI

- Urethritis
  - Inflammation of urethra
- Cystitis
  - Inflammation/infection of bladder wall
- Pyelonephritis
    - Infection of the kidney

UTI

- Causes
  - Chemical irritant
  - Bacterial infection
  - Sexual activity

UTI

- Signs and symptoms
  - Dysuria
  - Urgency
  - Frequency
  - Cloudy, foul smelling urine

UTI

- Treatment
  - Eliminate irritant
  - Urine and C & S
  - Antibiotic therapy
    - Uncomplicated UTI—Bactrim or Septra
    - Complicated UTI—Cipro
  - Urinary analgesic
    - Pyridium—orange colored urine

Nursing Assessment

- Pain on urination, flank pain, fever, chills, malaise
- Urine examined for cloudiness, blood, foul odor
- Predisposing factors
- Urinalysis and culture results

Prevention of UTI

- Patient education
  - Void frequently
  - Drink plenty of fluids
  - 10 oz. cranberry juice/day
  - Take shower rather than tub bath
  - Wipe perineum front to back

Prevention of UTI

- Patient education (cont.)
  - Urinate after intercourse
  - Avoid bubble baths and bath salts, perfumed feminie hygiene products, synthetic underwear, and constricting clothing (tight jeans)
  - Finish medications, do not stop when symptoms stop

Urological Obstructions

- Obstruction of urine flow is always significant
- Backup of urine destroys kidney
- Urethral strictures
  - Urethra lumen narrowing resulting from scar tissue, enlarged prostate, tumor, or calculi
- Renal calculi
  - Hard, generally small stones
  - Kidney stones: nephrolithiasis

Renal Calculi

- Common urinary salts
  - Calcium oxalate
  - Calcium phosphate
  - Magnesium ammonia
  - Uric acid
  - Cystine

Renal Calculi

- Causes
  - Hereditary factor
  - Chronic dehydration
  - Infection
  - Dietary intake
  - Immobility

Renal Calculi

- Signs and symptoms
  - Extreme flank pain
  - Renal colic
  - Hematuria
  - Dysuria
  - Frequency
  - Urgency
  - Nausea and vomiting

Renal Calculi

- Diagnostic tests and procedures
  - Urinalysis
  - KUB
  - Intravenous pyelogram

Renal Calculi

- Treatment
  - Medical management
    - Increase fluids
    - Analgesics
    - Strain all urine

Renal Calculi

- Treatment
  - Lithotripsy
    - Stone shattered or crushed into small pieces
- Types of Lithotripsy
  - Extracorporeal shockwave lithotripsy
  - Laser lithotripsy
  - Electrohydraulic lithotripsy

Renal Calculi

- Extracorporeal shockwave lithotripsy (ESWL)
  - Extracorporeal means it occurs outside the body—non-invasive procedure
  - Most common
  - NPO prior to procedure
  - May stop aspirin, ibuprofen, plavix, coumadin or any drugs interfering with blood coagulation, several days prior to procedure

Renal Calculi

- ESWL (cont.)
  - Mild sedative
  - Stone located with x-ray or ultrasound
  - High-energy shock waves break up stone into tiny pieces
  - Procedure time: 45 minutes to one hour

Renal Calculi

- ESWL (cont.)
  - Monitored for 2 hours post procedure
  - Resume daily activities in one to two days post procedure
  - Increase fluid intake after procedure
  - Analgesics
  - Small amount of hematuria is expected for a few days
  - Strain urine, save stone when passed

Renal Calculi

- Laser lithotripsy
  - Minimally invasive
  - Flexible laser inserted through cystoscope for stones in bladder, ureter, or kidney
  - Laser vaporizes the stone
  - Slowly replacing ESWL as the standard of care

Renal Calculi

- Advantages of laser lithotripsy over ESWL
  - Better treatment for more complex stones
  - Higher success rate with a single treatment
  - No risk of generating potential seeds for future stone formation

Renal Calculi

- Laser lithotripsy
  - Prior to procedure patient prepared same as ESWL with some additional blood work and possible EKG
  - General anesthesia
  - Usually same day procedure
  - Monitor patient same as post ESWL

Renal Calculi

- Electrohydraulic lithotripsy
  - Minimally invasive
  - Electric current used to fragment stone
  - Not lithotripsy of choice
  - Can cause injury to surrounding tissues and structures

Renal Calculi

- Treatment
  - Surgery—type of surgery depends on location of the stone
    - Endoscopically
    - Incision
- Requires hospital stay
- Increased risk of complications

Renal Calculi

- Prevention
  - Determine what stone is composed of
  - Drink plenty of fluids—mainly water
  - Decrease intake of high oxalate foods
    - Chocolate, nuts, tea, and spinach
  - Increased intake of animal protein (beef, chicken, pork, fish, and eggs) increase risk of renal calculi

Renal Calculi

- Nursing Assessment
  - Pain level
  - Strain all urine
  - Accurate I & O (alert oliguria/anuria)
  - Monitor urine: hematuria and pyuria
  - Monitor temperature and lab results for signs of infection

Hydronephrosis

- Result of an untreated urinary tract obstruction
- Treatable once diagnosed
- Due to obstruction urine backs up, distends ureter and progresses to kidney
- Unilateral or bilateral
- Kidneys turn into overfilled bags of urine normal function is lost

Hydronephrosis

- Gradual onset
- Treatment
  - Relieve obstruction
  - Possible nephrostomy tube

Hydronephrosis

- Nursing Care
  - Careful I&O
  - NEVER clamp nephrostomy tube
- Complications
  - UTI's
  - Renal failure

Cancer of the Bladder

- Most common urinary tract cancer
- Causes: Smoking, industrial pollution
- Signs and symptoms: Painless hematuria

Cancer of the Bladder

- Diagnosis
  - Cystoscopy
  - IVP or retrograde pyelogram
- 70% of bladder cancers are superficial
  - Ofter recur following treatment
  - Most never progress to a more invasive stage
  - High survival rate

Cancer of the Bladder

- Further diagnostic testing may be done to determine metastasis (usually if there is muscle involvement)
  - CAT scan
  - Bone scan

Treatment

- Superficial bladder cancer
  - Transurethral resection of bladder via cystoscope
  - Follow up: cystoscopy q 3-6 mths. for 2 yrs.
  - Then q 6 mths. until they go 5 yrs. Without recurrence
  - Smokers may lower their risk for recurrence if they stop smoking

Treatment

- If multiple tumors or incomplete resection of tumors
  - Following TUR of bladder chemotherapeutic medications instilled into bladder
  - BCG treatment
    - Weakened strain of organism that causes tuberculosis
    - Causes immune response that kills cancer cells
    - Once a week for six weeks
    - Side effects: hematuria, burning, frequency, fatigue

Treatment

- Muscular involvement
  - Rarely curable with TUR of bladder alone
  - Partial cystectomy followed by radiation
  - TUR bladder followed with chemo and radiation
  - Both of these are done to try and spare the bladder

Treatment

- Muscular invasive disease and no documented metastasis
  - Radical cystectomy
  - Men: prostate and seminal vesicles
  - Women: uterus, ovaries, urethra, and part of vaginal wall
- Urinary diversion
  - Urine leaves the body in a different manner

Treatment

- Incontinent urinary diversion
  - Ileal conduit
  - Stoma on abdomen
  - Almost continuously drains urine
  - Normal for urine to contain mucus
  - Ostomy appliance

Treatment

- Continent urinary diversion
  - Kock pouch
  - Section of ileum create reservoir for urine
  - Special nipple valve
  - Stoma on abdomen

Treatment

- Orthotopic bladder substitution
  - Section of bowel
  - Implant ureters and urethra
  - Void through urethra
  - Incontinence may be a problem
  - Intermittent catheterization may be necessary

Cancer of the Bladder

- Nursing management
  - Monitor urine output
  - Education

Cancer of the Kidney

- Survival rate 79-100% with early detection
- 90% of all kidney tumors malignant
- More common in males 50-70 yrs. of age

Cancer of the Kidney

- Black men slightly higher risk

Risk Factors: smoking, family hx of kidney cancer, polycystic kidney disease, chronic kidney failure, obesity, hypertension, and radiation.

Cancer of the Kidney

- Signs and symptoms
  - Seldom causes problems in early stage
  - Hematuria, dull pain in flank area, mass, unintentional weight loss
  - Accidental discovery
  - With metastasis s/s will depend on area or organ involved.

Cancer of Kidney

- Diagnosis
  - IVP
  - Ultrasound of kidney
  - Biopsy
  - CT scan
  - MRI

Cancer of Kidney

- Treatment
  - Radical nephrectomy
    - Removal of adrenal gland, fat, lymph nodes
  - Chemotherapy and radiation therapy

Cancer of the Kidney

- Signs and symptoms: Hematuria, dull pain in flank area, mass
- Radical nephrectomy
- Nursing management
  - Monitor urine output
  - Education

Polycystic Kidney Disease

- Hereditary disorder
- Result in renal failure
- Formation of multiple cysts in kidney
- Cysts: grapelike can contain serous fluid, blood or urine.
- Eventually replace normal kidney structures

Polycystic Kidney Disease

- S/S: dull heaviness in flank or lumbar area, hematuria. As disease progresses, s/s of renal failure
- NO TREATMENT to stop progression
- Symptomatic treatment: for relief of UTI, hypertension, renal failure

Diabetic Nephropathy

- Long-term complication of diabetes mellitus
- Most common cause of renal failure
- Atherosclerotic changes decrease blood to kidney
- Need smaller doses of insulin as progresses
- Chronic renal failure develops

Diabetic Nephropathy

- Long-term complication of diabetes mellitus
  - Diabetes affects circulation to kidneys
  - Complication of Type I or Type II
  - Prevention: keep glucose levels under good control
- Most common cause of renal failure

Diabetic Nephropathy

- Atherosclerotic changes decrease blood to kidney
  - Decreased blood supply results in damage to glomerulus
  - Protein penetrates membrane into urine rather than back to blood stream
    - Initially microalbuminuria
    - Usually span of 10-15 yrs.
    - Amount of protein in urine gradually increases

Diabetic Nephropathy

- Other reasons for kidney damage due to diabetes
  - Pyelonephritis: repeated attacks lead to renal scarring—kidney damage
  - Neurogenic bladder: results in incomplete bladder emptying resulting in increase in UTI's, increase risk for calculi, possible obstruction

Diabetic Nephropathy

- Need smaller doses of insulin as disease progresses
  - Kidney normally breaks down insulin
  - Improperly functioning kidneys, not broke down as quickly
  - Small doses of insulin circulate in body longer

Diabetic Nephropathy

- Chronic renal failure develops
  - As disease progresses, high output renal failure (nonoliguria) can develop
  - Large amounts of urine excreted, appears kidneys are functioning well, urine is not getting rid of most of the waste products
  - Toxic buildup in blood
  - At this stage nephrotic syndrome can develop
    - Large amts. of protein in urine, low amts. of albumin in blood stream: result: massive edema

Diabetic Nephropathy

- Signs and symptoms
  - Initially show small amts. protein in urine
  - Increase protein in urine
  - High output renal failure
  - Then decreased urine output
  - Toxic waste buildup in blood
  - s/s chronic renal failure
    - Figure 35-6 pg. #598 Williams and Hopper

Diabetic Nephropathy

- Treatment
  - Medical management
  - Good control of glucose levels to slow progression of disease
  - Hypertension medications
  - Weight loss if overweight
  - Dialysis when disease progresses to renal failure: dialysis or transplant

Nephrotic Syndrome

- Large amts. of protein lost in urine from increased glomerular membrane permeability
  - Diabetes
  - Glomerulonephritis
  - Primary nephrotic syndrome
  - Systemic lupus erythematosus
  - Infections
  - Cancer
  - Medications: nonsteroidal anti-inflammatory drugs
  - Table 35-1 pg.#598 Williams and Hopper

Nephrotic Syndrome

- High levels of protein in urine
- Low levels of protein in blood
- Edema
- Increased cholesterol

Nephrotic Syndrome

- Manage underlying cause and symptomatic treatment
  - Edema: diuretics, decrease Na intake
  - Decrease protein intake
  - Lipid lowering medications
  - Anticoagulants

Nephrosclerosis

- Hypertension damages kidneys by sclerotic changes
  - Thickening and hardening of renal arteries
  - Results in ischemia to kidneys
- Signs and symptoms
  - Initially protein in urine, hyaline casts
  - With progression s/s of renal failure

Nephrosclerosis

- Treatment
  - Treat the cause
  - Anti-hypertensive medications
  - Low sodium diet
  - Renal failure—dialysis

Glomerulonephritis

- Inflammatory disease of the glomeruli
- Causes glomerulus to be more porous
- Allows proteins, WBCs, RBCs to leak into urine

Glomerulonephritis

- Causes
  - Acute poststreptococcal
  - Goodpasture's syndrome
  - Chronic glomerulonephritis
- Symptoms
  - Oliguria, hypertension, electrolyte imbalances, edema, flank pain

Glomerulonephritis

- Medical management resolves
- Renal failure treatment

Renal Failure

- Occurs when the kidney's no longer perform properly in excreting wastes from the body

Renal Failure

- Impaired renal function can affect every system in our bodies
  - Fluid imbalances
  - Electrolyte imbalances
  - Decreased calcium levels, increased phosphorus levels
  - Decreased red blood cell production

Acute Renal Failure

- Sudden loss of kidney function
  - Can occur within hours or days
- Waste products accumulate in the blood
  - Due to rapid damage to kidneys
- Oliguria develops (less than 20 cc/hr)

Acute Renal Failure

- May recover
  - Depending on the cause
  - Supported through with temporary dialysis and prevention of complications (infection, pneumonia, or septicemia)

Acute Renal Failure

- Causes
  - Prerenal failure—problem prior to the kidneys
    - Decreased blood supply to kidneys
    - Decreased blood pressure from dehydration, blood loss, shock, or trauma

Acute Renal Failure

- Intrarenal failure—problem inside the kidney
  - Damage to nephrons
  - Infection leading to glomerulonephritis, blunt trauma to kidney, exposure to nephrotoxins, allergic reactions, rhabdomyolysis,

Acute Renal Failure

- Causes
  - Postrenal Failure—problem after the kidney
    - Obstruction

Treatment for Acute Renal Failure

- Treat underlying cause
- Temporary dialysis to treat uremia
- Continuous renal replacement therapy
  - Intensive care unit
  - Dialyse patient slowly and continuously over a 24 hour period
  - Bed bound, acutely ill, and intolerant rapid fluid shifts

Treatment

- Continuous renal replacement therapy
  - Removes fluid continuously along with hemodialysis
  - Alone to remove fluid/solutes in controlled, continuous manner in unstable patients
  - Blood flows through hemofilter, excess fluids/solutes move into collection bag, blood returns to patient

Nursing Care

- Careful monitoring of I&O, fluids, electrolytes, daily weights, hourly vital signs, and vascular access is vital

Chronic Renal Failure

- Gradual decrease in kidney function
- Irreversible—once nephrons are damaged they are lost forever
- Etiology
  - Diabetic nephropathy
  - Nephrosclerosis
  - Glomerulonephritis
  - Autoimmune diseases

Pathophysiology

- Large proportion of nephrons damaged
- Progressive
  - Early stage 50% of nephrons lost—no symptoms
  - Renal insufficiency—75% nephrons lost
    - Mild s/s of renal failure develop
    - Anemia
    - Increased BUN and creatinine
    - 24 hour creatinine clearance test to determine how much kidney function

Pathophysiology

- Primary goal—prevent any further damage
  End stage (ESRD)—90% nephrons lost
  - Extremely increased BUN and creatinine levels
  - Systemic symptoms
  - Urine production does not necessarily cease—urine is produced but is not excreting waste products
  - Dialysis or transplant necessary for survival

Pathophysiology

- Uremia—urea in the blood
- Affects all body systems—Figure 35-6 p. 598

Symptoms of Renal Failure

- Fluid accumulation
  - Edema, SOB, crackles, wheezing , distended neck vessels, increased blood pressure
  - Varying urine production—polyuria, oliguria or anuria
- Electrolyte imbalances
  - Hypernatremia—fld. retention, edema, elevated BP
  - Hyponatremia---confusion
  - Hyperkalemia—muscle weakness or cramping, abdominal cramping, diarrhea, confusion, cardiac dysrhythmias
  - Decreased calcium and increased phosphorus levels—prone to fxs, severe pruritis, muscle cramping or aching

Symptoms of Renal Failure

- Waste products retained
  - Azotemia—waste products of protein metabolism are not excreted and build up in blood
  - Increased BUN and creatinine, weakness, fatigue, confusion, seizures, twitching of extremities, n/v, lack of appetite, metallic taste in mouth, may smell odor of urine on breath, pale gray or yellowish bronze discoloration of skin, and pruritis
- Acid-base imbalances
  - Resulting in metabolic acidosis—headache, fatigue, weakness, n/v, and lack of appetite with progression lethargy, stupor, and coma

Symptoms of Renal Failure

- Anemia
  - Decreased production of hormone erythopoietin
  - Nurtritional deficiencies
  - Blood loss
  - Also decreased immune function—decreased WBC's, decreased platelet function (risk for bleeding)

Nursing Interventions

- Fluid accumulation
  - Daily weights
  - I&O
  - Fluid restriction will be ordered specifically, usually 1000cc/24 hr
  - Lung sounds
  - Document edema

Nursing Interventions

- Electrolyte imbalances
  - Monitor lab values
  - Restricting K+ intake
  - Educate patient on high K+ foods Box 35-6 p. 603
  - Kayexalate orally or retention enema
  - Encourage ambulation
  - Anti-pruritic medication
  - Tums or Caltrate

Nursing Interventions

- Waste products retained
  - Monitor lab values
  - Dietary education
  - Assistance with ADL's
  - Good oral hygiene and skin care
  - Seizure precautions

Nursing Interventions

- Acid-base imbalance
  - Monitor respiratory rate
  - Monitor LOC
  - Monitor lab values

Nursing Interventions

- Anemia
  - Procrit
    - Monitor blood pressure, notify MD of severe hypertension or noted increase
    - Additional antihypertensives may be needed during initiation of therapy
    - Possibility of seizures: seizure precautions should be instituted in patient who experience > than 4 point increase in hct in a 2 week period or exhibit any change in neurologic status. Risk greatest in the first 90 days of therapy

Nursing Interventions

- Procrit
  - Do not shake bottle vial—may inactivate medication
- Assist with activities of daily living

Medical Management

- Diet
- Medications
- Dialysis
  - Hemodialysis
  - Peritoneal dialysis
- Kidney Transplant

Medical Management

- Diet
  - High calorie
    - Maintain weight and energy needs
  - Low protein
    - Unless on dialysis, then need increased to compensate for the protein lost during dialysis
  - Low potassium
    - High K+ foods: citrus fruits and juices, bananas, salt substitute, potatoes (white and sweet), dairy products, meats, and chocolate
    - Also nuts, beans, seeds, and vegetables.

Diet

Important guidelines for decreasing K+ intake

- Cook frozen fruits and vegs. in water and rinse and drain well before serving
- Drain liquid from all canned fruits and vegs. and rinse before serving
- Peel potatoes, slice thin, soak in water 4 hr or overnight
- Check for hidden potassium by checking ingredient labels for potassium chloride
- Avoid salt substitutes
- Must limit foods high in potassium

Diet

- Low sodium
  - Limit canned and processed foods—contain high amounts of sodium
  - Read labels—choose foods with sodium content of 140mg or less per serving
  - Do not choose foods with sodium content of 400 mg of sodium per serving
  - Season instead of using salt—basil, curry, dill, garlic, ginger, lemon, mint, oregano, and thyme

Diet

- Increased calcium and decrease phosphorus
  - Calcium is increased or supplemented
  - Can have these foods to balance calcium and phosphorus but in limited amounts: milk, chocolate, cheese, beer, yogurt, firm tofu, and ice cream
  - Do not eat these foods, high in phosphorus: cola drinks, dried or baked beans, nuts and seeds of all kinds, and peanut butter

Diet

- Vitamins, iron, and minerals
  - Supplemented
  - Take iron between meals if using phosphate binders at mealtime—the iron can get caught by the binder and be eliminated from the body
  - Eat high fiber foods to prevent constipation—fresh fruits and vegetables low in potassium
  - Stool softener

Diet

- Fluid restriction
  - Usual 1000cc/24 hr
  - May change daily—depending on amount of urine output the previous day—500 cc plus amount of urine output yesterday= total fluid restriction
  - Helpful hints
    - Drink from small cup or glass
    - Divide your fluids for the day: meals, b/w meals, and snacks

Diet

- Helpful hints with fluid restriction
  - Take medications at mealtime
  - Limit amount of liquid foods
  - Rinse mouth with water rather than drink it
  - Chew sugar-free gum or suck on hard candy
  - Suck on lemon wedge to moisten mouth
  - Freeze grapes, berries, or small pieces of fruit and let them thaw slowly in your mouth—remember needs to be counted in with total fluid volume

Diet

- What counts as fluid
  - Ice cubes, ice chips
  - Water, coffee, tea, sodas, milk, juices cream, liquid creamers
  - Soups
  - Popsicles
  - Ice cream sherbets
  - Gelatin

Medical Management

- Medications
  - Diuretics– early in disease to increase output
  - Antihypertensives—control BP and decrease damage
  - Phosphate binders—Tums with meals
    - Bind to the phosphorus in the food you eat, keeps the phosphorus from being absorbed into your body, passes out of body with stool.
    - Phosphate binders can cause constipation

Medical Management

- Calcium/vitamin D supplements
  - Prevent fractures
- Kayexalate
  - Orally or retention enema
  - Potassium will be eliminated through bowels
  - Lower potassium levels
  - Hemodialysis best treatment for increased K+ levels

Medical Management

- Dialysis is started when symptoms of severe fluid overload, high potassium levels, acidosis, or symptoms of uremia are life threatening
- Dialysis
  - Hemodialysis—filters blood through a machine. Blood travels from body to machine, cleansed, and returned
  - Peritoneal dialysis—uses the natural lining of your abdomen. Fluid instilled into abdomen, cleansed, and fluid removed

Medical Management

- Hemodialysis
  - Artificial kidney—dialyzer
  - Usually 3-4 hours/3 or 4 times a week
  - Regular schedule set up
  - Hemodialysis center or hospital
  - Removes waste products from the blood, fluid and chemicals balanced

Hemodialysis

- A trained nurse or technician connects patient to dialysis machine, watches for problems, and makes patient as comfortable as possible
- Problems to watch for: chest pain, bleeding from the needle site, SOB, fever or chills, headache or lightheadiness, nausea or vomiting, itching, and muscle cramps
- Sudden drops in BP can occur

Hemodialysis

- During the dialysis, only about 250 ml of blood is out the patient's body at any one time
- Initially patient may experience headache, muscle cramps, or feel nauseated. These should decrease as their body gets used to the dialysis.
- Patients are given large doses of Heparin to prevent the blood from clotting while in the dialyzer. Monitor for bleeding.

Hemodialysis

- Following a dialysis treatment, the patient normally feels weak and fatigued, sometimes even too tired to eat.

Hemodialysis

- Before hemodialysis can be done, an access, is necessary. To maximize amount of blood cleansed during dialysis. Provides high volumes of blood flow continuously during treatment
- Ideally an access site should be prepared weeks or months before dialysis is started.
- Three basic types:
  - Venous catheter
  - Arteriovenous (AV) fistula
  - AV graft

Hemodialysis

- Venous catheter
  - Temporary access
  - Catheter inserted into large vein in neck, chest, or groin
  - Two ports to allow two-way flow of blood
  - Extremely important to ensure clamps in place
  - Not recommended for permanent access: can block easily, become infected, or cause narrowing of the veins in which they are placed
  - Used for initial hemodialysis and several weeks or months until permanent access is develops

Hemodialysis

- Arteriovenous (AV) fistula
  - Best type of long term vascular access: provides adequate blood flow for dialysis, lasts a long time, and has lower complication rate
  - Surgical procedure—local anesthetic—connecting an artery to a vein to allow more blood to flow into the vein The vein grows larger and stronger—making repeated insertions for hemodialysis treatments easier
  - Takes time to develop—months—rare up to 24 months
  - Less likely to clot or become infected

Hemodialysis

- Arteriovenous (AV) graft
  - Graft does not need to develop like AV fistula—can be used soon after placement—often within 2 to 3 weeks
  - If patient has small veins that won't develop properly into a fistula—a synthetic tube is implanted under the skin—connecting vein to artery--the tube becomes an artificial vein for repeated needle access for dialysis
  - Compared to fistulas, grafts have increased tendency to clot or develop infection and need to be replaced sooner
  - Some well cared for grafts can last for several years

Taking Care of Access Site

- Check access q8h in hospital, at home daily, at each dialysis treatment
- Keep site clean at all times
- USE ACCESS SITE ONLY FOR DIALYSIS
- Careful not to bump or cut site
- No blood pressure on that arm or draw blood
- Don’t wear jewelry or tight clothes over site

Taking Care of Access Site

- Do not sleep with access arm under your head or body
- Do not lift heavy objects or put pressure on access arm
- Check pulse every day
- Check for thrill or bruit
- Wash hands often

Taking Care of Access Site

- Problems to watch for
  - Can’t feel a thrill
  - Pain or numbness in arm or hand
  - Bleeding, redness, or warmth around access site
  - Sudden bulging out—normal to have slight bulge
  - Fever 101 or greater

Medical Management

- Peritoneal dialysis
  - Peritoneal membrane used as filter for blood
  - Dialysate solution used in process
  - Three steps: filling, dwelling, and draining
  - Access: peritoneal catheter placed into abdomen through stab wound just below umbilicus
  - End is capped when not in use
  - Dietary restrictions not as strict

Peritoneal dialysis

- Peritoneal dialysis is done at home
- 4 to 5 exchanges are needed daily, taking about 30 minutes each
- CAPD (continuous ambulatory peritoneal dialysis)
- CCPD (continuous cyclic peritoneal dialysis)
  - A machine does most of the exchanges at night while you sleep

Peritoneal dialysis

- Steps involved in PD
  - Instill bag of sterile dialysate into peritoneal cavity through the catheter
  - Usually 1500 to 2000 ccs
  - Left in peritoneal cavity for several hours—allowing waste products from blood to pass through the peritoneal membrane into the dialysate solution
  - Solution then drained into bag and discarded
  - Type of PD will be determined by patient and physician to best fit that individual

Peritoneal Dialysis

- Patient and family education is vital for success
- Sterile technique is imperative
- Wash hands prior to handling catheter
- Exchanges need to be done in clean environment
- Major complication: peritonitis—related to poor technique—first sign: abdominal pain

Peritoneal Dialysis

- Call doctor if:
  - Fever or chills
  - Pain in abdomen or around your catheter
  - Warm, red, or draining skin around catheter
  - Blocked flow into or out of your catheter
  - Dialysate that’s cloudy or bloody when it drains from your body

Peritoneal Catheter

- Always wash hands prior to touching catheter
- Keep catheter clean and covered
- Anchor catheter
- Do not let clothes rub or pull at it
- Do exchanges in clean place
- Never use a cloudy or leaking bag of dialysate
- Do not swim in lakes or streams

Medical Management

- Kidney transplant
  - Living donor
  - Cadaver donor
  - Waiting list of months to years, depending on patient's blood type
  - Medications to prevent rejection
  - Psychological